

# Determining the condition of the nation's lakes...and more: It's the National Lakes Assessment

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Every summer, teams across the country head into the field to collect data at over a thousand waterbodies as part of a collaborative effort to comprehensively assess water quality of the nation's waters (Figure 1). The United States Environmental Protection Agency (EPA) works with state, Tribal and federal partners to design and implement the National Aquatic Resource Surveys (NARS) using cost-effective and nationally consistent approaches. The NARS include four individual surveys that are implemented on a rotating basis:

- National Coastal Condition Assessment (NCCA 2010, 2015, 2020, and 2025);
- National Wetland Condition Assessment (NWCA 2011, 2016, and 2021);
- National Lakes Assessment (NLA 2007, 2012, 2017 and 2022); and
- National Rivers and Streams Assessment (NRSA 2008-09, 2013-14, 2018-19 and 2023-24).

Each survey uses a probabilistic design to assess the status of and changes in the quality of the nation's coastal waters, lakes and reservoirs, rivers and streams, and wetlands. The field crews sample the sites that are selected at random, which allows EPA to extrapolate the results from the sampled lakes to the full survey target population and provide a snapshot of the overall condition of the nation's water. Because the surveys use standardized field and lab methods, survey partners can compare results from different parts of the country and between survey years. For more information, see the NARS history page and Nahlik et al. 2025.

For the NLA, EPA, states, tribes, and other partners survey a wide array of lakes, from small ponds and alpine lakes to large lakes and reservoirs, on federal, tribal, state and private lands. To be included in the survey the waterbody must be within the 48 contiguous United States, greater than 1 hectare (ha) in surface area, a permanent

waterbody, at least 1 meter deep, and have a minimum 0.1 ha of open water. Samples are collected from an index site, which is the deepest location in a natural lake or the mid-point in a reservoir, and from ten littoral locations evenly distributed around the lake perimeter. The four survey cycles have generated large spatial datasets of chemical (in water, sediments, and fish tissue); physical habitat (shallow water and shoreline); and biological (phytoplankton, zooplankton, and benthic macroinvertebrate) parameters. Check the Map of NARS Sampling Locations for where we have sampled.

In 2022, over 80 field crews sampled 981 lakes from June through September. NLA 2022 results continued to show widespread nutrient pollution, with 50 percent of lakes in poor condition for phosphorus and 47 percent in poor condition for nitrogen. Additionally, high levels of algae and cyanobacteria growth were observed, with 30 percent of lakes classified



Figure 1. NLA 2022 crews practicing field protocols at Sheridan Lake, SD during the regional training attended by the states of North Dakota, Nevada, South Dakota, Utah, and Wyoming and Standing Rock Sioux Tribe.

as hypereutrophic. The algal toxin microcystin was detected in 50 percent of the nation's lakes (Figure 2). Of the 268,020 lakes in the target population, approximately 31 percent were natural lakes (83,560 lakes), and 69 percent were reservoirs (184,460 lakes).

The 2022 field crews also collected fish fillet samples that were analyzed for contaminants of human health concern including mercury, polychlorinated biphenyls (PCBs) and per- and polyfluoroalkyl substances (PFAS). It had been 20 years since EPA conducted a lake fish survey of this magnitude and this was the first NLA survey to include PFAS samples. Contaminants were detected in all composite fish tissue samples, with the mercury concentrations of fish tissue samples exceeding the EPA's 300-ppb water quality criterion in about half of the lakes and PCB concentrations of fish tissue samples exceeding the EPA's 12-ppb cancer screening level in 6 percent of lakes (Figure 3).

For more information on the 2022 survey and results, visit the NLA 2022 Web-Report. To explore all survey results including regional results and results from past surveys, visit the NLA Data Dashboard.

The NLA reports and data dashboard serve as essential communication tools for EPA. However, what truly resonates with our survey partners is our commitment to enhancing water quality monitoring programs nationwide. By fostering collaboration on new methods, developing new water quality indicators, and advancing research, we elevate the NLA beyond the core reporting requirements. In this issue of *LakeLine*, we are thrilled to showcase the NLA research initiatives born from field collaboration and the subsequent analysis and application of survey data. Our field crews have eagerly collected samples that extend beyond typical lake monitoring, such as benthic macroinvertebrates, while EPA scientists have utilized NLA data to tackle national water quality challenges and create tools to inform future policy and lake management decisions. Enjoy the lake condition insights and data discoveries shared within!

## Reference

Nahlik, A.M., S.G. Paulsen, M. Dumelle, S. Holdsworth, S. Lehmann, N.S. Tulve, S.J. Paul, and H.C. Frey. 2025.

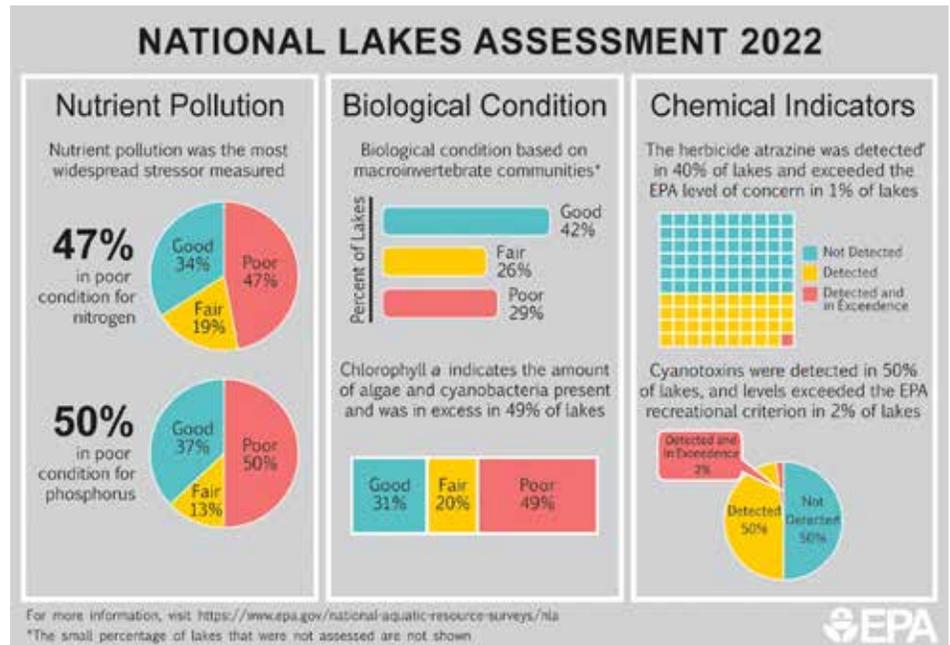


Figure 2. Key chemical and biological findings from NLA 2022.

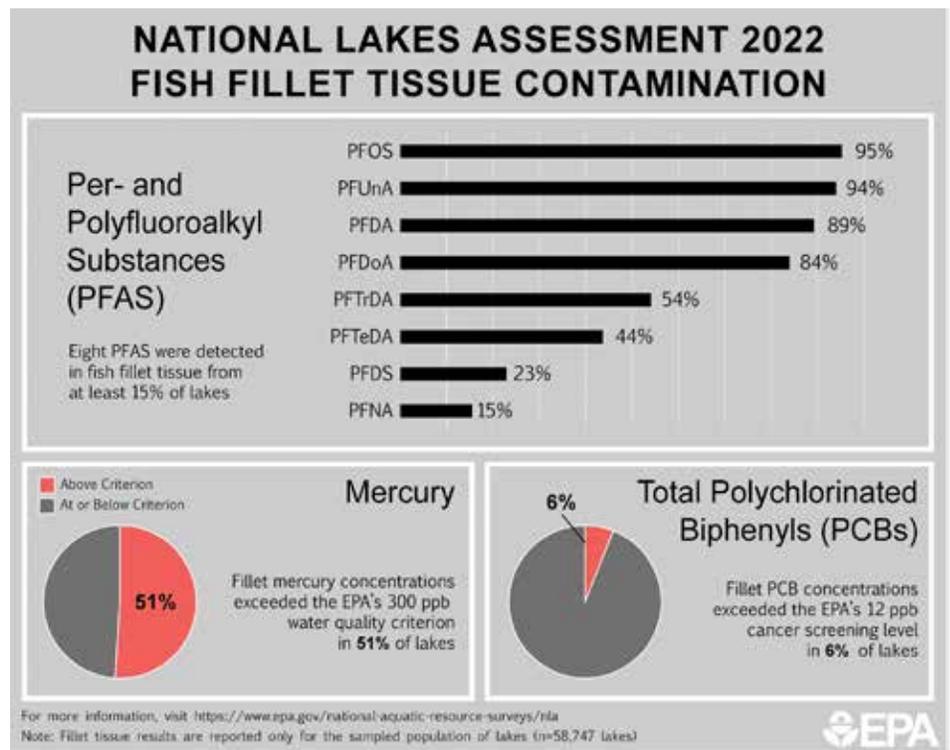


Figure 3. Fish fillet tissue contamination results from NLA 2022.

National Aquatic Resource Surveys (NARS): the foundation for long-term aquatic monitoring data across the United States. *Environ Monit Assess* 197, 1291(2025). <https://doi.org/10.1007/s10661-025-14629-8>

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